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THE

ONTARIO WATER RESOURCES

COMMISSION

WATER POLLUTION SURVEY

OF THE

TOWN OF ARNPRIOR

COUNTY OF RENFREW

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THE

ONTARIO WATER RESOURCES

COMMISSION

Report

on

WATER POLLUTION SURVEY

of the

TOWN OF ARNPRIOR

in the

COUNTY OF RENFREW

Division of Sanitary Engineering
September 8, 1964

Report on

WATER POLLUTION SURVEY

of the

TOWN OF ARNPRIOR

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WATER POLLUTION SURVEY

of the

TOWN OF ARNPRIOR

INTRODUCTION

A water pollution survey of the Town of Arnprior was performed by Commission staff on September 8, 1964. Surveys of this type are made by the Division of Sanitary Engineering, Ontario Water Resources Commission, in order to locate active and potential sources of surface water pollution. Recommendations are made concerning the abatement of conditions which adversely affect water quality.

INTERVIEWS WITH OFFICIALS

Discussions were held with the following officials during this survey:

Town of Arnprior - Mr. R. M. Simpson, Mayor;
Mr. W. J. Thompson, Clerk-Treasurer;
Mr. W. F. Frieday, Town Engineer;
Mr. M. Keith, Employee of the Engineering Department;

Renfrew County Health Unit - Mr. J. Watt, Chief Public Health Inspector.

Appreciation is expressed to the town officials for their general co-operation during this survey, not only by providing maps and information, but also by providing outstanding assistance in the collecting of samples.

TOWN OF ARNPRIOR

The Town of Arnprior is located in the south-eastern corner of the County of Renfrew at the Ottawa River. The Madawaska River flows through Arnprior and empties into the

Ottawa River which forms the northern boundary of the municipality. The town abuts the County of Carleton at the south-eastern corporation boundary. To the south and west of the town lies the Township of McNab in the County of Renfrew.

Surface transportation routes serving Arnprior are the Canadian National Railway, the Canadian Pacific Railway, and Highways 17 and 29, respectively.

According to the 1964 Municipal Directory, the population of Arnprior is approximately 5,632. The approximate area of the town is 2,078 acres with slightly more than one-half of this acreage lying on the west side of the Madawaska River where most of the developed part of the municipality is situated.

THE MADAWASKA RIVER AT ARNPRIOR

General

Since the Madawaska River flows through the heart of Arnprior, various aspects of this watercourse are of vital concern in future planning for the town.

Elevations

According to information received from local officials, the elevation of the Madawaka River at its confluence with the Ottawa River is 239.0 feet above sea level. The top of the dam near the Highway 17 bridge in Arnprior has a reported elevation of approximately 255.0 feet.

Hydrology

Although the dam in Arnprior is controlled by local authorities, flows in the Madawaska River are also subject to

the manipulation of control works at Stewartville which is located approximately 11.5 miles upstream.

The only hydrologic data pertaining to the Madawaska River near Arnprior have been obtained from the hydrometric station at Stewartville. Waba Creek converges with the Madawaska River downstream from Stewartville and upstream from Arnprior, but no flow data are available concerning this creek.

The following hydrologic data pertaining to the Madawaska River at Stewartville were obtained from the Department of Northern Affairs and National Resources, with these records having been provided by the Hydro-Electric Power Commission of Ontario:

Climatic Year	Mean Flow (in cfs)	Date	Max. Flow (in cfs)	Date	Min. Flow (in cfs)
1953-1954	2,810	April 19	13,900	Sept. 6	10
1954-1955	3,400	April 17	15,900	*	0
1955-1956	3,140	May 1	10,600	*	0
1956-1957	2,260	July 6	5,400	*	0
1957-1958	3,140	April 19	11,100	*	0
1958-1959	2,510	Apr.18&19	11,000	*	0
1959-1960	3,940	April 20	21,000	*	0
1960-1961	1,930	May 10	6,100	*	0
1961-1962	1,850	April 18	5,560	*	0

*Flow is subject to regulation by storage in upstream lakes and by hydro-electric power developments.

WATER USES

Municipal

The Madawaska River is the source of the municipal water supply. This river receives the untreated sewage flows and most of the storm drainage flows from Arnprior. Unless dictated otherwise by engineering studies, the Madawaska River might be the receiving water for the effluent from future

municipal sewage treatment works within the municipality.

Industrial

The Madawaska River receives industrial waste flows via the municipal sewer systems.

Recreational

Recreational use of the Madawaska River within the town is not extensive. Watercraft are moored and serviced on the river bank near the mouth of the watercourse. The public bathing area is located on the Ottawa River at the town park which is situated west of the mouth of the Madawaska River.

WATER SUPPLY

The municipal water purification plant is located at the foot of Havey Street on the west bank of the Madawaska River. The plant is situated upstream from all known outfalls within the town.

The river water enters the pump suction well at the plant through a 12-inch diameter steel intake pipe which reportedly is 25 feet in length. The treatment works include equipment for colour removal, chlorination facilities, and pressure filters.

Incorporated in the water distribution system is an elevated water storage tank which is located in the eastern part of Arnprior and has a capacity in excess of 0.3 million gallons. Information pertaining to water pumpage during 1963 is summarized as follows:

Average daily flow during year	=	838,300 gallons
Highest average daily flow in one month	=	923,700 gallons (June)
Maximum daily flow	=	1,224,300 gallons
Per capita water use	=	149 gpd

The municipal officials at Arnprior are giving consideration to the feasibility of constructing a new water purification plant approximately 3,000 feet upstream from the existing works and in the vicinity of the bridge which will require construction in conjunction with the reported relocation of Highway 17. The present plant would be abandoned at that time.

SURFACE WATER DRAINAGE

Most of the surface drainage flows are conducted by combined storm and sanitary sewers to the Madawaska River. A new storm sewer on Daniel Street extends from Edey Street to the sewer outlet on the west bank of the Madawaska River south of the Highway 17 bridge.

It is probable that some surface drainage flows gain access to the small creek which enters Arnprior at its southwestern boundary and empties into the Madawaska River north of the C.P.R. bridge. It was obvious during the survey on September 8, that this creek experiences a flow only during periods of rapid run-off.

A tributary of Dochart Creek extends through the western part of Arnprior to empty into the main creek within the Township of McNab. There was no flow in this tributary within the town during the survey.

It is probable that some surface drainage flows gain direct access to the Ottawa River.

SEWAGE WORKS

Reportedly, a negligible number of private sewage

disposal systems are utilized in Arnprior. Most premises are served either by the municipal combined sewers or by the Daniel Street sanitary sewer. In the absence of sewage treatment works, the sewers conduct all sewage flows directly to the Madawaska River.

A sewage pumping station is located on the west bank of the Madawaska River at the foot of Elgin Street. This package-type lift station delivers sewage flows from local premises to the main sewers. Reportedly, the overflow from the sewage pumping station to the river is seldom utilized although such was occurring on September 8 during a period of moderate precipitation.

PROPOSED SEWAGE TREATMENT WORKS

Officials of the Town of Arnprior have been aware for several years that the provision of municipal sewage treatment works is necessary. The discharging of untreated sanitary and industrial waste flows to the Madawaska River in Arnprior in an unsatisfactory arrangement and, realizing the necessity for terminating this condition, the appropriate officials are planning remedial action.

The selection of a site for the proposed sewage treatment plant has prompted recent discussions between municipal officials and the Ontario Water Resources Commission. It has become obvious that the site considered several years ago, which is located at the foot of First Avenue near Highway 17 on the east side of the Madawaska River, must be disregarded now since this area has been developed for residential

purposes. The town officials tend to favour the selection of a site which is located between Hartney Street and the C.P.R. on the east side of the river. This latter site is located upstream from the developed part of the town and approximately 600 to 800 feet downstream from the municipal water purification plant intake. The general area has been zoned for industrial development. It has been reported by local officials that, if this site should be chosen for the construction of a sewage treatment plant, sewage collected in the western part of the town could flow by gravity via a sewer crossing the river at the Highway 17 bridge and continuing thence to a point near the proposed plant where the sewage would be pumped into the treatment works.

Reportedly, the municipal officials have engaged a firm of consulting engineers to study the sewage treatment requirements of the town. It is probable that these studies will include an appraisal of sites available for the location of a sewage treatment plant.

Situated contiguous to the western boundary of Arnprior is a section of the Township of McNab which has experienced urban development. It was reported unofficially that inadequate sewage disposal facilities and contaminated private water supplies are not uncommon in this area which is, in effect, a projection of Arnprior. If this region either should become annexed by Arnprior, or should apply for the extension of sewer services from the town, it is obvious that present planning with regard to sewage treatment works in

Arnprior should include these possibilities.

INDUSTRY

The principal industrial firms located in Arnprior are listed as follows:

Name of Firm	Product
Arnprior Builders	Lumber
Ayling and Ramage	Boats
Boeing Aircraft (Vertol Division)	Helicopters
A. F. Campbell and Son	Sash and door
Dochart Brick and Tile Limited	Field tile, brick
Gillies Bros.	Lumber
Jeffrey Luggage	Luggage
Kenwood Mills Limited	Textiles
Measurement Engineering	Electronics
Pfizer Limited	Pharmaceuticals
Playtex Limited	Rubber products
Scheel Brothers	Sash and doors
Sky-Rotors Limited	Helicopters

Although some of the larger manufacturing plants are located on the west side of the Madawaska River in Arnprior, a large area located on the east side of the river has been zoned for industrial development.

According to the information obtained during this survey, all of the industrial waste flows are discharged to the municipal sewers and thence to the Madawaska River.

The Kenwood Mills Limited is at least one manufacturing plant in Arnprior where the industrial waste reportedly has a high population equivalent. Since space might not be available at this textile plant for the installation of adequate preliminary waste treatment facilities, the load which these wastes would impose on municipal sewage treatment works should receive special consideration by the municipal officials and the firm of consulting engineers.

The industrial plants in Arnprior have been inspected in the past by members of the Industrial Wastes Branch of this Commission.

PRIVATE OUTFALLS

Although waste outfalls from private premises might exist to some extent in Arnprior, such outfalls were not located during this survey.

SAMPLING PROCEDURES

Samples were collected from the waters of the Madawaska River in Arnprior, from the Ottawa River at two locations along the shoreline of the municipality, from Dochart Creek beyond the town limit, and from the various outfalls to the Madawaska River within the corporation boundaries. Appended to this report is a map of Arnprior showing the locations of sampling points. The pertinent laboratory results are appended to this report in Tables I to V, inclusive.

The atmospheric temperature prevailing during this survey on September 8 was approximately 75 degrees Fahrenheit. A period of heavy precipitation commenced at 11:30 a.m. and persisted intermittently throughout the afternoon.

INTERPRETATION AND SIGNIFICANCE OF LABORATORY RESULTS

The analyses employed to determine the quality of samples were: biochemical oxygen demand (BOD), solids, tests for specific chemicals, and the enumeration of coliform organisms.

The BOD of sewage, industrial wastes, or polluted waters, is the oxygen required during stabilization of the

decomposible organic or chemical material by aerobic biochemical action. A five-day BOD determination with incubation at 20 degrees Centrigrade is reported. A high BOD is indicative of organic or chemical pollution. The BOD of a watercourse should not exceed four parts per million (ppm).

The analyses for solids include tests for total, suspended, and dissolved solids. The results are reported in ppm. The first test measures both the solids in solution and in suspension. The suspended solids indicate the measure of undissolved solids of organic or inorganic nature in suspension. Land erosion, sewage, and industrial wastes are significant sources of suspended solids. The effect of suspended solids in water is reflected in difficulties associated with water purification, and deposition in streams which could interfere with the habitat of aquatic life. The dissolved solids are a measure of those solids in solution.

The coliform count is employed to obtain an enumeration of coliform organisms. The presence of coliforms indicates pollution by human or animal excrement, or by some non-faecal forms. The number of coliforms is reported per 100 millilitres (ml) of the sample. The membrane filter technique was used in the examination of these samples. It is the opinion of the OWRC that the presence of coliforms in a watercourse should not exceed 2,400 organisms per 100 ml of water.

Additional specific laboratory tests were performed to determine the quality of waste discharges and, in some

instances, their effect on surface waters. Some of these analyses included tests for the presence of nitrogen, alkalinity, ether solubles, as well as pH values.

SAMPLE RESULTS

The laboratory results of analyses and examinations performed on the samples collected are tabulated in appendices to this report as follows:

Table I - Ottawa River
Table II - Madawaska River and its tributary in Arnprior
Table III - Tributary of Dochart Creek in Arnprior
Table IV - Municipal combined and sanitary sewer outfalls
Table V - Municipal storm sewer outfalls

Ottawa River

The high coliform content revealed in the Ottawa River at the dock near the municipal park in Arnprior cannot be explained readily unless flows from the Madawaska River veer upstream toward this sampling point. The coliform content revealed in Dochart Creek near its mouth was not high. No intermediate outfalls were disclosed during this survey.

Downstream from the mouth of the Madawaska River, the quality of the Ottawa River water was satisfactory for surface water, according to the laboratory tests which were performed. It was reported locally that the quality of the Ottawa River water is not adversely affected along this shoreline by the flows from the Madawaska River since these latter flows tend to penetrate the Ottawa River for some distance prior to dispersal.

Madawaska River and its Tributary in Arnprior

The laboratory results pertaining to water samples obtained from the Madawaska River in Arnprior indicate that

the coliform content of this watercourse increases abruptly within the town, undoubtedly due to the affects of the untreated sewage flows discharged to the watercourse there. Although some comments have been received to the effect that this pollution is not significant since the flows soon receive dilution in the Ottawa River, it is emphasized that the untreated sewage flows from any municipality can adversely affect the chemical and bacterial qualities of the receiving waters and provide undesirable nutrification thereof.

The tributary of the Madawaska River in Arnprior was devoid of flow during the period of sampling on September 8, although minimal flows were beginning to collect towards evening due to the precipitation occurring.

Tributary of Dochart Creek in Arnprior

Although Dochart Creek empties into the Ottawa River within the Township of McNab , a small tributary of this creek traverses a section of the western part of Arnprior. There was no flow in this tributary within the town during this survey.

Municipal Combined and Sanitary Sewer Outfalls

The presence of raw sewage was indicated in the samples collected from the following four combined sewer outfalls to the Madawaska River in Arnprior:

Sampling Point M.O.34 C

This submerged combined sewer outfall is located on the east side of the river near the projection of Fourth Avenue. The sample was obtained from the sewer at a manhole

near the river bank.

Sampling Point M.O.56 C

Flows in the combined sewer which extends along Burwash Street to the west bank of the river were sampled at a manhole on Burwash Street east of John Street. Ether solubles were high in this flow which includes wastes from the Kenwood Mills Limited.

Sampling Point M.O.54 C

A combined sewer extends from the intersection of First Avenue and Bridge Street to the east bank of the Madawaska River. The sewage flows in this sewer were sampled at a manhole located at the aforementioned intersection.

Sampling Point M.O.57 C

A combined sewer extends along the north side of Highway 17 and terminates with a submerged outlet in the river near the east bank. The sewage flows were sampled at a manhole located on the river bank.

The municipal sanitary sewer which was constructed recently on Daniel Street discharges on the west bank of the Madawaska River north of the Highway 17 bridge. In conjunction with the reconstruction of Daniel Street, the former combined sewer was replaced by a sanitary sewer and a storm sewer. The flows being discharged through the sanitary sewer to the river (sampling point M.O.59 S) were sampled during this survey at a manhole located on Daniel Street at Rock Lane. Untreated sewage was indicated in the sample obtained.

The discharge to the river from the overflow pipe

at the Elgin Street sewage pumping station was sampled (sampling point M.O.81 R) and the pertinent laboratory results signify the quality of these raw sewage flows.

Municipal Storm Sewer Outfalls

The municipal storm sewer on Daniel Street has its outfall (sampling point M.O.63 W) on the west bank of the Madawaska River at a point south of the Highway 17 bridge. The sample was obtained at a manhole located near the junction of Daniel Street and Madawaska Street. The pertinent laboratory results suggest that sewage flows were present in this sewer which has been described as a conduit for storm water only. It is apparent that objectionable wastes were gaining access to this storm sewer. The pertinent samples were obtained prior to the commencement of the heavy rainfall on September 8.

SUMMARY

A water pollution survey of the Town of Arnprior was performed by Commission staff on September 8, 1964. The primary objective of this survey was to locate and sample all discharges to watercourses within the town, as well as to sample the receiving waters. It is thereby possible to determine if surface water pollution occurs to an appreciable extent.

The Town of Arnprior does not have municipal sewage treatment works, although the construction of such works has been proposed by local officials. Reportedly, a firm of consulting engineers has been engaged to study the sewage

treatment requirements of the municipality.

The untreated sanitary and industrial waste flows are discharged through four combined sewer outfalls and one sanitary sewer outfall to the Madawaska River. The presence of sewage was revealed in the only municipal storm sewer outfall which was located and sampled during this survey.

The pertinent laboratory results reveal that the quality of the Madawaska River water is adversely affected by the wastes discharged thereto in Arnprior. The coliform content of the river water increases abruptly in this section of the watercourse.

RECOMMENDATIONS

Officials of the Town of Arnprior deserve commendation for their commencement of a programme to provide adequate sewage treatment works, and are urged to complete this project as soon as possible.

During present and future works programmes, efforts should be made to exclude all contaminated flows from conduits which are designated as storm sewers.

All of which is respectfully submitted,

District Engineer: J. K. Theil

Approved by: K. H. Sharpe per JKT
K. H. Sharpe, Director

/mh

TABLE I

OTTAWA RIVER

ALL SAMPLES EXCEPT PH REPORTED IN PPM UNLESS OTHERWISE INDICATED

SAMPLE POINT NO.	SOURCE	5-DAY BOD	SOLIDS			BACTERIOLOGICAL EXAMINATION
			TOTAL	SUSP.	DISS.	COLIFORMS/100 ML M.F.
0.168.72 A	OTTAWA RIVER AT SHORELINE - APPROX. 3,000 FEET DOWNSTREAM FROM MOUTH OF MADAWASKA RIVER	0.9	82	2	80	940
0.169.55 A	OTTAWA RIVER AT DOCK NEAR MUNICIPAL PARK IN ARNPRIOR, AND UPSTREAM FROM MOUTH OF THE MADAWASKA RIVER.	1.2	80	4	76	12,000

TABLE II

ALL SAMPLES EXCEPT PH REPORTED IN PPM UNLESS OTHERWISE INDICATED

MADAWASKA RIVER AND ITS TRIBUTARY IN ARNPRIOR

SAMPLE POINT NO.	SOURCE	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	TOTAL KJELDAHL AS N	BACTERIOLOGICAL EXAMINATION COLIFORMS/100 ML M.F.
M.O. 1 A	MADAWASKA RIVER NEAR ITS MOUTH, EAST SIDE	1.6	86	4	82	0.59	40,000
M.O. 1 A	MADAWASKA RIVER NEAR ITS MOUTH, WEST SIDE	1.3	98	3	95	0.78	45,000
MA.1.13	TRIBUTARY OF MADAWASKA RIVER AT CARSS STREET			NO FLOW			
MA.2.15	AFOREMENTIONED TRIBUTARY AT TOWN LIMIT			NO FLOW			
M.1.22	MADAWASKA RIVER AT THE ARNPRIOR WATER PURIFICATION PLANT - UPSTREAM FROM THE DEVELOPED PART OF THE TOWN	1.2	112	1	111	0.46	130

TABLE III

ALL SAMPLES EXCEPT PH REPORTED IN PPM UNLESS OTHERWISE INDICATED

TRIBUTARY OF DOCHART CREEK IN ARNPRIOR

SAMPLE POINT NO.	SOURCE	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	BACTERIOLOGICAL EXAMINATION COLIFORMS/100 ML M.F.
D.0.22	DOCHART CREEK NEAR MOUTH	1.6	64	2	62	850
DA.1.47	TRIBUTARY OF DOCHART CREEK AT DIVISION ST. (WEST LIMIT OF ARNPRIOR)		NO FLOW			
DA.1.99	TRIBUTARY OF DOCHART CREEK AT ROAD NEAR SOUTH LIMIT OF ARNPRIOR		NO FLOW			

TABLE IV

ALL SAMPLES EXCEPT PH REPORTED IN PPM UNLESS OTHERWISE INDICATED

MUNICIPAL COMBINED AND SANITARY SEWER OUTFALLS

SAMPLE POINT No.	SOURCE	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	PH AT LAB	ALKALINITY AS CaCO 3	ETHER SOLUBLES	BACTERIOLOGICAL EXAMINATION COLIFORMS/100 ML. M.F.
M.O.34 C	COMBINED SEWER OUTFALL AT FOOT OF FOURTH AVE. - AT EAST BANK OF MADAWASKA RIVER	140.	490	106	384	7.1	190		1, 170,000
M.O.56 C	COMBINED SEWER OUTFALL FROM BURWASH ST. AT WEST BANK OF RIVER	370.	674	150	524	7.1	164	57	117,000,000
M.O.54 C	COMBINED SEWER OUTFALL FROM CORNER OF FIRST AVE. AND BRIDGE ST. ON EAST BANK OF RIVER	370.	546	120	426	6.6	162		136,000,000
M.O.57 C	COMBINED SEWER OUTFALL AT NORTH SIDE OF HWY. 17 TO EAST BANK OF RIVER	5.8	222	46	176	7.3	120		84,000
M.O.59 S	SANITARY SEWER OUTFALL TO WEST BANK OF RIVER NORTH OF HWY. 17 BRIDGE	370.	594	122	472	7.1	230		600,000,000
M.O.81 R	OVERFLOW FROM SEWAGE PUMPING STATION AT FOOT OF ELGIN ST. - TO RIVER	270.	792	262	530	7.1	304		140,000,000

TABLE V

ALL SAMPLES EXCEPT PH REPORTED IN PPM UNLESS OTHERWISE INDICATED

MUNICIPAL STORM SEWER OUTFALLS

SAMPLE POINT NO.	SOURCE	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	PH AT LAB	ALKALINITY AS $CaCO_3$	BACTERIOLOGICAL EXAMINATION COLIFORMS/100 ML M.F.
M.O.63 W	MUNICIPAL STORM SEWER OUTFALL ON WEST BANK OF MADAWASKA RIVER SOUTH OF HWY. 17 BRIDGE	24.	312	42	270	7.0	96	510,000

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